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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/067,266	02/07/2002	Toshio Morita	Q63212	6691

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SUGHRUE MION, PLLC
2100 PENNSYLVANIA AVENUE, N.W.
SUITE 800
WASHINGTON, DC 20037

EXAMINER

GRAY, JILL M

ART UNIT	PAPER NUMBER
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1774

DATE MAILED: 09/29/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/067,266

Applicant(s)

MORITA ET AL.

Examiner

Jill M. Gray

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 14 September 2004.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1,3,5-11,13-16,18,20 and 21 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1,3,5-11,13-16,18,20 and 21 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- ☒ Notice of References Cited (PTO-892)
- ☐ Notice of Draftperson's Patent Drawing Review (PTO-948)
- ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____
- ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date _____
- ☐ Notice of Informal Patent Application (PTO-152)
- ☐ Other: _____

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on September 14, 2004 has been entered.

Response to Amendment

The rejection of claims 1-3, 5-18 and 20-21 under 35 U.S.C. 103(a) as being unpatentable over PCT Publication WO 00/58536 (Nishimura et al, English equivalent 6,489,026 B1) in view of European Patent Publication 583,062 A1, (Harada) is withdrawn in view of applicants' amendments and arguments.

The cancellation of claims 2, 12, and 17 is noted. Currently, claims 1, 3, 5-11, 13-16, 18, and 20-21 are under prosecution.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1, 3, 5-11, 13-16, 18, and 20-21 are rejected under 35 U.S.C. 103(a) as being unpatentable over PCT Publication WO 00/58536 (Nishimura et al, English

equivalent 6,489,026 B1, and hereinafter referred to as Nishimura) in view of Masuko et al, 6,780,388 B2 (Masuko).

Nishimura teaches vapor grown carbon fibers containing boron crystals. The fibers have a diameter of 1μ or less, a bulk density of 0.05g.cm^3 , a hollow part in the center and boron concentration, and are formed from a mixture of a boron compound and a vapor grown carbon fiber. The mixture has a boron concentration in amounts of 10 mass% or less, and is heat-treated at a temperature of 2000°C or higher in the presence of an inert gas, as required by claims 1, 6, and 10, and compressed as required by claim 7. The boron compound can be of the type contemplated by applicants in claim 9, such as elementary boron and boron nitride and can be deposited on the surface of the fibers, per claim 16. In addition, the amount of boron in the carbon fibers is 0.1-3 mass%, which is within applicants' range, per claims 3, 13 and 18. See column 8, lines 9-36 and lines 63-65. Nishimura is silent as to the utility of nitrogen as an inert gas. Masuko teaches an electrically conducting fine carbon composite powder comprising carbon powder and vapor grown carbon fibers having a boron content in the range of 0.001 to 5% by mass. See column 4, lines 1-2 and 32-38. The carbon powder has a Co value of less than 0.680 nm and a boron content in the range of 0.1 to 5% by mass and is produced by adding a boron compound, to carbon black, heat-treating the mixture at 2500°C or more in a non-oxidative atmosphere having an inert gas such as nitrogen or argon. See column 5, lines 40-45, column 6, and lines 7-25. In addition, Masuko teaches that the vapor grown carbon fibers have a diameter within applicants' range (column 9, lines 18-35) and that when the vapor grown carbon fiber is heat-

treated in the same manner as in the carbon black, particularly, by mixing with a boron compound, such as boron nitride, and then heat-treating, the vapor grown carbon fiber can have improved electrical conductivity. See column 10, lines 25-30. In view of this teaching, one of ordinary skill in the art can reasonably presume that the vapor grown carbon fibers have a Co of less than 0.680nm as required by claims 3, 13, and 18. Furthermore, at column 14, Masuko teaches vapor grown carbon fiber having a fiber diameter and boron concentration formed from a mixture of a boron compound and a vapor grown carbon fiber, and subjected to processing conditions similar to those contemplated by applicants in claims 6-9.

While Nishimura is silent as to the usage of nitrogen as his inert gas, it is the examiner's position that the inert gases of nitrogen and argon are obvious variants over one another. In addition, the teachings of Masuko of heat-treatment in a furnace with an inert gas such as nitrogen or argon would have provided direction to the skilled artisan as to what parameters were critical in the production of vapor grown carbon fibers, namely, heat-treating in the presence of an inert gas, and a suggestion as to those inert gases that would have been suitable in said vapor grown carbon fiber formation, or more specifically, nitrogen and argon. Accordingly, it would have been obvious to one of ordinary skill in the art at the time the invention was made, in view of the teachings of Masuko to modify the process of Nishimura by using nitrogen as the inert gas with a reasonable expectation of success of obtaining vapor grown carbon fibers suitable in the formation of composite articles. As to the amount of boron in the depth of 1 nm required by claims 1, 11, 14, 16, and 21, Nishimura is silent as to this

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property. Nonetheless, the fact that Nishimura teaches a boron content within applicants' range and a process of making that is substantially similar to that set forth by applicants, it is the examiner's position that this property is within applicants' range as well in the absence of factual evidence to the contrary. Moreover, it is also the examiner's position that where the general conditions of a claim are disclosed in the prior art, it is not inventive to discover the optimum or workable ranges by routine experimentation. As to the specific resistivity and heat conductivity as set forth in claims 1, 5, 11, 15, 16, and 20, Masuko teaches vapor grown carbon fibers produced by a process substantially similar to that contemplated by applicants, wherein heat-treatment can occur in the presence of nitrogen gas. Therefore, it is the examiner's position that when nitrogen gas is used, as taught by Masuko, the specific resistivity of the resultant vapor grown carbon fibers is within the range contemplated by applicants.

As a result, the combined teachings of Nishimura and Masuko would have rendered obvious the invention as claimed in present claims 1, 3, 5-11, 13-16, 18, and 20-21.

Claim Rejections - 35 USC § 102

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claims 6 and 8-10 are rejected under 35 U.S.C. 102(e) as being anticipated by Masuko et al, 6,780,388 B2, (Masuko) as applied above.

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Claims 6 and 8-10 are rejected under 35 U.S.C. 102(e) as being anticipated by Masuko et al, 6,780,388 B2, (Masuko) as applied above.

Masuko teaches a method for producing an electrical insulating vapor grown carbon fiber comprising mixing boron compound with a vapor grown carbon fiber having a diameter within applicants' range to form a mixture and heat-treating the mixture at 2,000° C or more in the presence of a nitrogen compound, per claim 6. The formation of a boron nitride electrical insulating material is inherent. The boron compound can be boron carbide and the nitrogen compound can be nitrogen, as required by claims 8-9 and the boron concentration is within applicants' range. See column 10, lines 20-42 and column 14.

Therefore, the prior art teachings of Masuko anticipate the invention as claimed in present claims 6 and 8-10.

Response to Arguments

Applicant's arguments with respect to claims 1, 3, 5-11, 13-16, 18, and 20-21 have been considered but are moot in view of the new ground(s) of rejection.

No claims are allowed.

Conclusion

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jill M. Gray whose telephone number is 571-272-1524. The examiner can normally be reached on M-F 10:30-7:00.

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Rena Dye can be reached on 571-272-3186. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).


Jill M. Gray
Examiner
Art Unit 1774

jmg